6.2/31 $\frac{d}{dx}\left(\sqrt{x^2+5}\right) =$

$$\frac{d}{dx}\left((x^2+5)^{1/2}\right) = \frac{1}{2}(x^2+5)^{-1/2}(2x)$$

$$\int \frac{1}{2}(x^2+5)^{-1/2}(2x)\,dx = \sqrt{x^2+5} + C$$

Q: $\int \frac{1}{2}(x^2+5)^{-1/2}\,dx =$ who knows?

6.2

24)

$$\int \sec x(\tan x + \cos x)\,dx$$

$$= \int \sec x \tan x\,dx + \int \sec x \cos x\,dx$$

$$= \sec x + \int 1\,dx \quad + C$$

$$= \sec x + x + C$$

$\sec x + x + 1$

$\sec x + x + 2$

$\sec x + x - 100$

6.2/30

$$\int \frac{\sin 2x}{\cos x}\,dx = \int \frac{2\sin x\cos x}{\cos x}\,dx$$

$$= \int 2\sin x\,dx = 2\int \sin x\,dx$$

$$= 2(-\cos x) + C$$

6.2/17

$$\int \frac{x^5+2x^2-1}{x^4}\,dx$$

$$= \int \frac{x^5}{x^4} + 2\frac{x^2}{x^4} - \frac{1}{x^4}\,dx$$

$$= \int x^1 dx + 2\int x^{-2} dx - \int x^{-4} dx$$

$$= \frac{x^2}{2} + 2\left(\frac{x^{-1}}{-1}\right) - \frac{x^{-3}}{-3} + C$$

20)

$$\int \frac{1}{2t} - \sqrt{2}\, e^t \, dt$$

$$= \int \frac{1}{2}\left(\frac{1}{t}\right) dt - \sqrt{2} \int e^t \, dt$$

$$= \frac{1}{2}\left(\ln t\right) - \sqrt{2}\left(e^t\right) + C$$

1) $\int x(1+x^3)\,dx =$

2) $\int (2+y^2)^2\,dy =$

3) $\int 4\sec^2 x + \csc x \cot x\,dx =$

4) $\int \frac{\sec\theta}{\cos\theta}\,d\theta$

6.2/17)

$$\int \frac{x^5+2x^2-1}{x^4}\,dx$$

$$= \int \frac{x^5}{x^4} + 2\frac{x^2}{x^4} - \frac{1}{x^4}\,dx$$

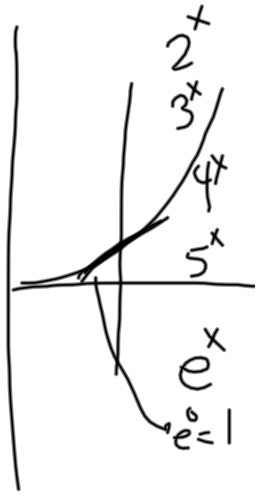
$$= \int x^1\,dx + 2\int x^{-2}\,dx - \int x^{-4}\,dx$$

$$= \frac{x^2}{2} + 2\left(\frac{x^{-1}}{-1}\right) - \left(\frac{x^{-3}}{-3}\right) + C$$

(19)

$$\int \frac{2}{x} + 3e^x \, dx$$

$$= 2\int \frac{1}{x} dx + 3\int e^x \, dx$$



$$= 2(\ln x) + 3e^x + C$$

$\frac{d}{dx}(e^x) = e^x$ because $\lim_{h \to 0} \frac{e^{(x+h)} - e^x}{h} = e^x$

20)

$$\int \frac{1}{2t} - \sqrt{2}e^t \, dt$$

$$= \frac{1}{2}\int \frac{1}{t} \, dt - \sqrt{2}\int e^t \, dt$$

$$= \frac{1}{2}\ln t - \sqrt{2}e^t + C$$

30)

$$\int \frac{\sin(2x)}{\cos x}\,dx$$

$$= \int \frac{2\sin x\cos x}{\cos x}\,dx$$

$$= 2\int \sin x\,dx = 2(-\cos x)+C$$

22) $\int 4\sec^2 x + \csc x \cot x \, dx$

$= \int 4\sec^2 x \, dx + \int \csc x \cot x \, dx$

$= 4(\tan x) + (-\csc x) + C$

$\int \sec x \tan x \, dx$
$= \sec x + C$

$\frac{d}{dx}(\sec x) = \sec x \tan x$

$\frac{d}{dx}(\sin x) = \cos x$

$\frac{d}{dx}(\tan x) = \sec^2 x$

$\frac{d}{dx}(\csc x) = -\csc x \cot x$

$\frac{d}{dx}(\cos x) = -\sin x$

$\frac{d}{dx}(\cot x) = -\csc^2 x$

24) $\int \sec x(\tan x + \cos x)\,dx$

$= \int \sec x \tan x + \sec x \cos x \; dx$

$= \int \sec x \tan x \, dx + \int 1 \, dx$

$= \sec x + x + C$

26)

$$\int \frac{dx}{\csc x} = \int \frac{dx}{\left(\frac{1}{\sin x}\right)}$$

$$= \int dx(\sin x) = \int \sin x \, dx = -\cos x + C$$

31) $\int \frac{1}{2\sqrt{1-x^2}} - \frac{3}{1+x^2}\,dx$

$= \frac{1}{2}\int \frac{1}{\sqrt{1-x^2}}dx - 3\int \frac{1}{1+x^2}dx$

$= \frac{1}{2}\sin^{-1}(x) - 3\tan^{-1}(x) + C$

35)

slope field for $\frac{dy}{dx} = x$